Bushnell®

A million things to look at. Perhaps more.

Tiny points of light in the night sky magically become planets, galaxies and brilliant stars. Quality optics penetrate the inky blackness of space to reveal its wonders. And precision adjustment keeps space in the right space. This is the Bushnell® Astronomical Telescope. Welcome to the universe.

Magnify life.

TELESCOPES

78-8831 525 x 3"

NORTHSTAR®

GO TO STAR LOCATOR
WITH REAL VOICE OUTPUT

Real Voice Output™
With the touch of a button this talking telescope describes the wonders of the night sky in a real human voice – an interactive and educational way to explore the heavens.

Hand-held control module.

NEW **525 x 3" w/RVO**
A "talking" high-power, reflector telescope. Up to 525x magnification and 3-inch reflector mirror.
78-8831
Style: Reflector
Mount: Kinematic

NEW **675 x 4.5" w/RVO**
An advanced Real Voice Output version of our premier Northstar 675 x 4.5".
78-8846
Style: Reflector
Mount: Kinematic

Our Northstar® telescopes offer the amateur astronomer state-of-the-art computer-driven location and tracking capability with simple, push-button control. With a built-in data base of 20,000 celestial objects, you simply call up your target on the hand-held control module, enter a simple "go to" command and the Northstar computer does the rest. Once locked on, tracking the object for prolonged viewing is automatic. Our new RVO (Real Voice Output) models offer verbal communications. The remote, hand-held control module features red, backlit push buttons and a red, illuminated LCD read-out for easy viewing without impairing your night vision. The telescope also features our new 1x wide-angle, red dot finderscope. Additional features include a quick-release tripod and accessory tray for fast, easy assembly.

NORTHSTAR®

GO TO STAR LOCATOR

The North Star® Series Features:

- 4mm and 20mm eyepieces.
- Power-boosting Barlow lens.
- "Go To" computerized tracking technology.
- Red Dot LED finderscope.
- Remote hand-held control module.
- Camera adaptable.
- Quick release tripod.
- Kinematic mount.
- Accessory tray.

525 x 3"
An outstanding high-power, reflector telescope for the beginner to advanced amateur astronomer.
78-8830
Style: Reflector
Mount: Kinematic

675 x 4.5"
Our most powerful, advanced technology reflector telescope with up to 675x magnification and massive 4 1/2-inch reflector mirror.
78-8845
Style: Reflector
Mount: Kinematic

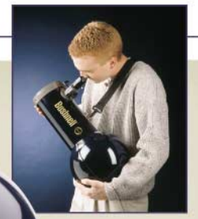
Cradle for hand-held control.

MODEL	SPECIFICATIONS	MOUNT	LENGTH	EYEPIECES	MAGNIFICATIONS
78-8830	525 x 3", Motorized GoTo Reflector	Kinematic Mount	700 mm	4mm, 20mm	35, 105, 175, 525
*78-8831	525 x 3", Motorized GoTo Reflector	Kinematic Mount	700 mm	4mm, 20mm	35, 105, 175, 525
78-8845	675 x 4.5", Motorized GoTo Reflector	Kinematic Mount	900 mm	4mm, 20mm	45, 135, 225, 675
*78-8846	675 x 4.5", Motorized GoTo Reflector	Kinematic Mount	900 mm	4mm, 20mm	45, 135, 225, 675

* New for 2003

Magnify life.

VOYAGER®



Convenient shoulder strap.

Voyager® telescopes offer impressive optical quality and precise mechanical construction resulting in the clearest view of the most distant objects in the sky. Loaded with innovative features – such as our zoom eyepiece, patented Penta mirror technology, and our rotary power turret – ruggedly constructed, and convenient to use, there is no better choice when it comes to balancing performance with affordable price.

100 x 4.5"

Compact cradle mount, reflector telescope ideal for field trips and camping. It features a convenient shoulder strap and a powerful 100x magnification.

78-2010

Style: Reflector

Mount: Cradle

470 x 60mm

Versatile refractor telescope zooms instantly from 50x to 150x and features an Easy Track mount and adjustable aluminum tripod.

78-9470

Style: Refractor

Mount: Easy Track

ZOOM

PENTA TECHNOLOGY inside

The Voyager® Series Features:

1.25" diameter eyepiece.

Innovative features such as

- Zoom eyepiece.
- Penta mirror technology.
- Rotary power turret.

Camera adaptable.

Aluminum tripods.

PENTA TECHNOLOGY inside

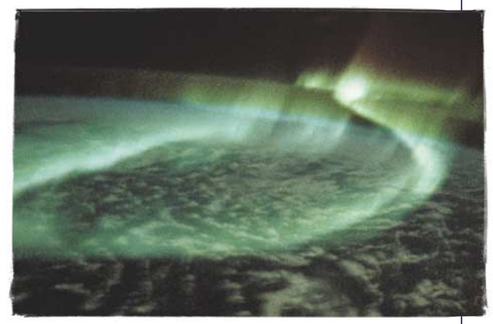
565 x 60mm

A quality refractor telescope with premium optics, counter weight and equatorial mount for long-exposure astrophotography.

78-9565

Style: Refractor

Mount: Equatorial



570 x 60mm

A compact, high-quality refractor telescope with an Easy Track mount, moon filter and a Rotary Power turret.

78-9570

Style: Refractor

Mount: Easy Track

Convenient carrying case.

MODEL	SPECIFICATIONS	MOUNT	LENGTH	EYEPIECES	MAGNIFICATIONS
78-2010	100 x 4.5" Reflector	Cradle Mount	500mm	5mm, 27mm, Plossl	18, 100
78-9470	470 x 60mm Refractor	Easy Track® Mount	750mm	Zoom, 8mm, 15mm	50, 94, 50-150, 250, 470
78-9565	565 x 60mm Refractor	Equatorial Mount	750mm	8mm, 12.5mm, 20mm	38, 60, 94, 113, 180, 226, 281, 360, 565
78-9570	570 x 60mm Refractor	Easy Track® Mount	910mm	4mm, 10mm, 20mm	45.5, 91, 114, 227.5, 570

Magnify life.

DEEP SPACE™

Our Deep Space™ series offers a fantastic value for beginning and intermediate astronomers. With all-metal tube construction and quality optics for crisp, clear viewing, they offer popular features and ease-of-use at an equally popular price sure to please budget-minded star gazers.

525 x 3"

A great full-featured starter scope for soon-to-be serious amateur astronomers.

78-9003

Style: Reflector

Mount: Yoke

675 x 4.5"

A high-powered 4 1/2" reflector telescope with big-scope performance at an affordable price.

78-9518

Style: Reflector

Mount: Equatorial

420 x 60mm

Value-priced refractor telescope with quality features and optics for viewing ease and enjoyment.

78-9512

Style: Refractor

Mount: Yoke

150 x 50mm

A good quality, economical entry-level refractor telescope.

18-1560

Style: Refractor

Mount: Pan Head

The Deep Space™ Series Features:

- All-metal tube construction.
- Barlow lens.
- Universal coding system.
- Camera adaptable.
- 1.25" diameter eyepieces.
- Full length adjustable aluminum tripod.

UNIVERSAL CODING SYSTEM

Patented symbol-based coding system lets you master accessory use in under 5 minutes.

MODEL	SPECIFICATIONS	MOUNT	LENGTH	EYEPIECES	MAGNIFICATIONS
78-1560	150 x 50mm Refractor	Pan Head Mount	600mm	4mm, 20mm	30, 150
78-9003	525 x 3" Reflector	Yoke Mount	700mm	4mm, 20mm	35, 105, 175, 525
78-9512	420 x 60mm Refractor	Yoke Mount	700mm	5mm, 20mm	35, 105, 140, 420
78-9518	675 x 4.5" Reflector	Equatorial Mount	900mm	4mm, 12mm, 20mm	45, 75, 135, 225, 675

HARBORMASTER™

The Harbormaster™ refractor telescope provides a touch of distinction at a tremendous value. The solid brass tube and vintage cherry-finished base are classic, yet the modern optics deliver excellent performance.

The Harbormaster™ Features:

- Cherry finish base.
- Solid brass tube.
- Refractor telescope.

35 x 60mm

Table-top mount, refractor telescope.

78-6036

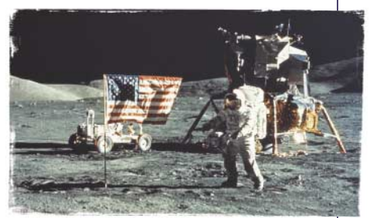
Style: Refractor

Mount: Desktop

MODEL	SPECIFICATIONS	MOUNT	LENGTH	EYEPIECES	MAGNIFICATIONS
78-6036	35 x 60mm	Desktop	525mm	15mm	35

ACCESSORIES

Our high-quality accessories will expand the use of any of our 1.25" format telescopes. Select a new eyepiece for a wider range of magnification or add our convenient camera adapter to photograph objects in the night sky.



9mm Kellner Eyepiece

High quality multi-element 1.25" diameter eyepiece.

78-0101

25mm Kellner Eyepiece

High quality multi-element 1.25" diameter eyepiece.

78-0102

Camera Adapter

Used with low power eyepiece and camera for astrophotography.

78-0104

2x Barlow Lens

Double the magnification of any 1.25" diameter eyepiece.

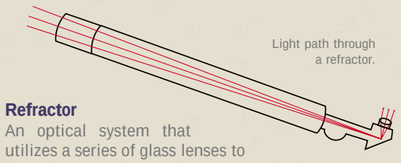
78-0105

Magnify life.

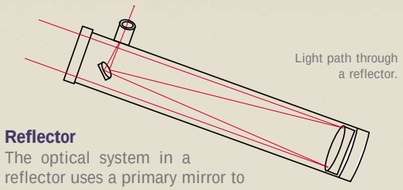
TELESCOPE TERMINOLOGY

An optical instrument used for viewing distant objects usually in the night sky.

Types of Telescopes



Refractor
An optical system that utilizes a series of glass lenses to refract or bend the light from a distant object such that it can be focused to a point and magnified by an eyepiece. Popularized by Galileo in the 17th Century, it is sometimes referred to as a Galilean refractor.



Reflector
The optical system in a reflector uses a primary mirror to reflect the light from a distant object such that it can be focused to a point and magnified by an eyepiece. Popularized by Sir Isaac Newton in the 17th Century, it is sometimes referred to as a Newtonian reflector.

Barlow Lens
An auxiliary lens that increases the power by a factor. For example, a 2x barlow doubles the magnification of the telescope.

Erecting Lens
Lens used with a refractor telescope when viewing land-based objects to correct the normally upside-down image provided by an astronomical telescope.

Finderscope
On most astronomical telescopes a lower powered finderscope with a wider field-of-view lets the user quickly locate the object to be viewed by the high-magnification main telescope. There are two types of finderscopes, optical and red dot.

Optical

Red Dot

Focal Length
The measured light path of the optical system (tube length), typically measured in millimeters.

Focusing Knob
Controls the rack and pinion focusing system. Permits smooth movement of eyepiece for precise, sharp images.

Objective Lens Size (or Aperture)
The second number in the formula (100x4.5") is the diameter of the objective lens or mirror. The aperture relates directly to how bright images will appear and how much detail is revealed. The larger the objective lens, the better. The size of the telescope's objective lens, or aperture, limits the amount of power that can be used effectively. As the magnification of an object increases, the brightness of the image decreases. This is because the light gathered by the telescope is being spread over a larger area. Aperture also limits the clarity of an image at increased magnification. When magnified beyond an aperture's recommended power, the image dims and becomes fuzzy.

Magnification (Power)
Telescopes are often referred to by two numbers separated by an "x". For example: 100x4.5". The first number is the power or magnification of the telescope. With a 100x4.5" telescope, the object being viewed appears to be 100 times closer than you would see it with the unaided eye. The magnification of a telescope is determined by dividing its focal length by the focal length of the eyepiece being used. For example, a 500mm telescope with a 5mm eyepiece would magnify objects 100x. Thus, a telescope can provide nearly any magnification required depending on the focal length of the eyepiece used. Since most objects in the sky are rather large, high magnification isn't necessary. Rather, a telescope that gathers lots of light is needed to make dim objects appear brighter and sharper. The power or magnification contributes to the overall size and bulk of the telescope. This is because as the power increases, so must the physical size of the objective lens.

Without

100x

Penta Mirror Technology*
This patented Bushnell® technology breakthrough allows for left-to-right correct view of the stars (not backwards – as in most telescope models) taking the guesswork out of where to move the telescope. This feature provides unparalleled ease of use for finding and tracking objects with a 90 degree viewing angle and 1.25" eyepiece adapter.

Resolution
Resolution, or definition, is the ability of a telescope to distinguish fine detail and retain clarity.

Rotary Power Turret*
This patented Bushnell feature allows for magnification and accessory changes to occur through a simple twist of the turret or accessory dial. Accessories are incorporated into the telescope so there are no loose parts, and magnification and accessory changes can be made instantaneously to suit viewing conditions.

*An exclusive feature of Bushnell® models.

How to Choose

When selecting a telescope, consider which target objects you plan to explore as well as your level of experience. For viewing most night sky objects, you'll want a telescope with as much aperture as possible. Keep in mind that as the size of the objective lens or mirror increases, so does the size of the telescope. So be sure to select a telescope that isn't too heavy to manage or too complicated for you to set up – especially if portability is a necessity.

Refractors
Refractors are less affected by atmospheric instabilities making them perfect for observing the Moon and planets. Perfect for first-time and novice astronomers, small refractors are lightweight, portable and require very little maintenance. And, if you're interested in viewing both land and celestial objects, refractors are equipped for both uses.

Reflectors
Reflectors feature larger apertures for a wide range of viewing at an affordable price. Designed with the eyepiece located at the top of the tube, reflectors are more comfortable to use for viewing night-sky objects such as nebulae, the Moon, planets and galaxies. Reflectors tend to be heavier and larger than refractors.

Eyepieces
Lower power eyepieces provide a wider field-of-view and a brighter image making them ideal for viewing the full Moon and planets, star clusters, nebulae and the constellations. To focus in on the finer details of the Moon and planets such as mountains, ridges and craters, use an eyepiece with higher magnification.

Mounts
There are two basic types of telescope mounts, the altitude-azimuth (or altaz) and the equatorial. Altaz mounts are the easiest to maneuver and are ideal for first-time astronomers. Equipped with a manual control or motor drive that allows you to follow the movement of objects across the night sky, equatorial mounts are ideal for more experienced astronomers.

Types of Telescope Mounts

The mount secures the telescope to the tripod. It allows you to move your telescope horizontally and vertically. There are two primary types of telescope mounts, altitude-azimuth (or altaz) and equatorial. Altaz mounts move up-down and left-right. Equatorial mounts are tilted to align with the rotational (polar) axis of the Earth.

Easy Track

Equatorial

Kinematic

Yoke

Easy Track® Mount*
An altaz mount that allows quicker and easier set-up and storage and reduces image shake caused by wind or ground tremors.

Equatorial Mount
An advanced telescope mount that compensates for the earth's rotation.

Kinematic Mount*
Undoubtedly the most precise, yet simple telescope mount in years, this high-precision altaz mount uses the principle that it requires three points to form a plane. Designed for optimum shape, the Kinematic mount features three points of contact in both horizontal and vertical planes.

Yoke Mount
A U-shaped altaz mount.

Tripod
A tripod serves as a steady platform for the telescope to allow hands-free use. Because of its powerful magnification, even the slightest jiggle of the telescope is enough to move it from its target. Tripods feature three adjustable legs so the telescope can be used even when the ground is uneven.

Types of North Star™ Telescopes
The NorthStar allows any beginner or amateur to navigate the skies like a professional.

Real Voice Output™
Talking telescope describes the night sky with the touch of a button in a real human voice – an interactive and educational way to explore the heavens.

"GO TO" Computerized Star Locator
This exciting feature utilizes an on-board computer and advanced motorized technology to allow you to quickly locate and automatically follow over 20,000 pre-programmed astronomical objects with the touch of a button. Educational descriptions of each object are also provided.

*An exclusive feature of Bushnell® models.

Bushnell®

Discover the night.

Since mankind has been on the planet, there's been a desire to see at night. Now that dream has come true with Bushnell® Night Vision. Perfect for wildlife observation, home security, search and rescue and more, Bushnell Night Vision products are comprised of high-quality image intensifier tubes and optics that amplify existing light allowing you to see in conditions too dark for the naked eye. Each model features an infrared illuminator for vision in total darkness. Stop guessing what's out there and discover the night with Bushnell Night Vision.

Magnify life.

NIGHT VISION

26-1554 1.5 x 54mm

NIGHT VISION

Bushnell's Advanced Night Vision monocular features IQ Optics which produces images comparable to Generation 2 night vision devices. The Advanced Night Vision unit uses fiber optic bundles to eliminate distortion and significantly enhance resolution, delivering superior image quality comparable to units costing hundreds of dollars more.

1.5 x 54mm

This rugged water-resistant night vision device uses advanced technology and fiber optic bundles for resolution, light gain and image quality comparable to Generation 2 night vision devices. Also contains a powerful built-in infrared illuminator for viewing in complete darkness, operates on 2 AA batteries and includes durable carrying case.

26-1544

Style: Advanced Night Vision Monocular

The Night Vision 26-1544 Features:

- Rugged, water-resistant housing.
- IQ Optics for superior image quality.
- Built-in infrared illuminator.
- Uses 2 AA alkaline batteries.
- Durable carrying case.

NEW

2.0 x 36mm

Compact, lightweight and low-cost, this night vision monocular makes night vision affordable for the most budget-minded sportsman. With a unique utilitarian design, this monocular can be used effectively in a number of positions by both right- and left-handed users.

26-2036

Style: Gen 1 Monocular

Bushnell® Night Vision. Ten state-of-the-art, compact designs that offer superior vision in the lowest light conditions. Setting the standard in light-gathering technology, each product features built-in infrared illuminators for enhanced images even in the darkest shadows. Ideal when camping, caving and observing wildlife under the veil of darkness, they're equally suited for patrolling warehouses and similar surveillance operations where no detectable ambient light exists. Our audio monocular model even features a boom microphone, headphone and recording port, so you'll see and hear exactly what you're looking at. Bushnell Night Vision is the ultimate in stealth, and that's a quality no flashlight can ever claim.

2.5 x 42mm

Compact, lightweight monocular offers outstanding clarity in the darkest conditions.

26-0100

Style: Gen 1 Monocular

NEW

2.5 x 42mm

This waterproof compact, lightweight monocular offers outstanding viewing clarity in the darkest conditions. It even floats!

26-0100W

Style: Gen 1 Monocular

2.5 x 42mm

Offers outstanding viewing clarity and the versatility of Dual I.R. Beam Intensity (High and Low Beam).

26-0200

Style: Gen 1 Monocular

2.5 x 42mm

Lightweight monocular with a high-sensitivity audio boom microphone and headphone will detect sounds up to 90 yards away.

26-0300

Style: Gen 1 Monocular

Night Vision Uses:

- Scouting game.
- Camping fun.
- Nighttime navigation.
- Wildlife observation.
- Security and surveillance.
- Exploring caves.
- Night fishing.
- Search and rescue.

MODEL	MAGNIFICATION x OBJ. LENS	RANGE (ft. / m)	VIEWING (ft.@100yds / m@100m)	FIELD-OF-VIEW INFRARED ILLUMINATOR	BATTERY TYPE	SIZE (in. / mm)	WEIGHT (oz. / g)	TRIPOD MOUNT
26-1554	1.5 x 54	3–1800 / .9–549	72 / 24	Yes (Built-In)	AA (2)	7.3 x 3.1 x 3.5 / 185 x 80 x 90	27 / 760	No
* 26-2036	2.0 x 36	5–500 / 1.5–152	140 / 47	Yes (Built-In)	AA (2)	6.9 x 4.2 x 2.0 / 176 x 107 x 51	19 / 539	No
26-0100	2.5 x 42	4–600 / 1.2–183	79 / 26	Yes (Built-In)	AA (2)	6.7 x 3.7 x 2.7 / 170 x 95 x 70	14 / 397	Yes
* 26-0100W	2.5 x 42	4–600 / 1.2–183	79 / 26	Yes (Built-In)	AA (2)	6.7 x 3.7 x 2.7 / 170 x 95 x 70	14 / 397	Yes
26-0200	2.5 x 42	4–600 / 1.2–183	79 / 26	Yes (Built-In)	AA (2)	6.7 x 3.7 x 2.7 / 170 x 95 x 70	14 / 397	Yes
26-0300	2.5 x 42	4–600 / 1.2–183	79 / 26	Yes (Built-In)	AA (2)	6.7 x 3.7 x 2.7 / 170x95x70	17 / 482	Yes

* New for 2003

Magnify life.

NIGHT VISION

2.5 x 42mm

These full-featured night vision binoculars are exceptionally comfortable to use during long periods of observation and viewing. Light weight, extra-long viewing range and a wide field-of-view makes them ideal for law enforcement, night navigation and wildlife surveillance.

26-0400

Style: Gen 1 Binocular

4.3 x 66mm

Super performance at longer ranges, this is a higher power monocular with an extra large objective lens, adjustable infrared illuminator and a special aperture control setting to increase or decrease the amount of light which reaches the image intensifier.

26-4366

Style: Gen 1 Monocular

3.1 x 50mm

These night vision binoculars feature higher magnification and extra-large objective lenses. With a tripod mount and IDP adjustment, they're ideal for prolonged viewing at longer ranges.

26-3150

Style: Gen 1 Binocular

1 x 20mm

Versatile goggle with headgear that can also be detached for use as a binocular.

26-1020

Style: Gen 1 Goggle with Headgear

MODEL	MAGNIFICATION x OBJ. LENS	RANGE (ft. / m)	VIEWING (ft.@100yds / m@100m)	FIELD-OF-VIEW INFRARED ILLUMINATOR	BATTERY TYPE	SIZE (in. / mm)	WEIGHT (oz. / g)	TRIPOD MOUNT
26-0400	2.5 x 42	4–600 / 1.2–183	94 / 31	Yes (Built-In)	AA (2)	6.5 x 6.3 x 3.0 / 165 x 160 x 76	28 / 794	Yes
26-4366	4.3 x 66	16–450 / 4.9–137	52 / 17	Yes (Attachable)	AA (2)	8.6 x 3.9 x 2.9 / 218 x 99 x 74	45 / 1270	No
26-3150	3.1 x 50	1.5–400 / .5–122	79 / 26	Yes (Built-In)	CR123A (1)	7.9 x 6.45 x 2.7 / 201 x 164 x 69	40 / 1134	Yes
26-1020	1 x 20	.5–100 / .2–30	210 / 70	Yes (Built-In)	N (2)	5.25 x 2.25 x 4.25 / 133 x 57 x 108	18 / 510	No

NIGHT VISION TERMINOLOGY

An optical device comprised of high-quality image intensifier tubes and optics that amplify existing light to allow you to see in conditions too dark for the naked eye.

How Does It Work?

1. Available light (energy) is collected by the objective lens and focused on the image intensifier.
2. Inside the intensifier a photocathode is "excited" by the light and converts the energy into electrons.
3. The electrons accelerate across an electrostatic field inside the intensifier and strike a phosphor screen (like a monochrome TV screen) which emits an image that you can see. This acceleration of electrons provides gain and enhances the image.

1. Image intensifier tube
2. Phosphor screen
3. Objective lens
4. Infrared illuminator

Types of Bushnell® Night Vision

Generation 1
Does not require an active infrared light source. Instead it amplifies available ambient light.

Advanced Night Vision
Utilizes fiber optic bundles to eliminate distortion and noise resulting in a high-resolution, high-contrast premium image. Superior contrast allows you to see dark subjects against darker backgrounds. Lower distortion renders a flatter, less rounded image with crisper details.

Night Vision Monocular
A Night Vision device for use with one eye.

Audio Monocular
Features direct sound amplification technology. Headphones, boom microphone and recording port included.

Night Vision Binocular
Two complete sets of optics and image intensifiers that are connected and share a common power supply.

Angle or Field-of-View
The measure of the angle defining the field visible through the Night Vision system at a distance of 100 yards.

Bright Source or Over-Light Protection
An electronic circuit that turns the power to the Night Vision device down or off when it is exposed to bright light (such as automobile headlights). This protects the image intensifier and extends its life. The device will recover and resume normal operation in 1–2 minutes.

Eyepiece Focus
Used to match your Night Vision scope or binocular to your specific eyesight.

Image Intensifier or Intensifier Tube
The active component in a Night Vision System that amplifies light and presents a usable image.

Infrared (I.R.) Illuminator
Provides a light source for the system to amplify, yielding enhanced images in very low light conditions such as caves where no ambient light is available for amplification.

Built-In Dual-Beam Infrared Illuminators
Allows you to adjust the I.R. from low to high power according to your needs – high beam for pin-point illumination, and low beam for wide-angle illumination.

Objective Lens
Collects all available light and focuses it on the image intensifier. It also provides image magnification. The best objective lenses have low magnification (5x or less), are high-speed (f2 or faster) and are coated for maximum efficiency in the near-infrared bandwidth.

Phosphor Screen
Positioned at the back of the intensifier tube, the green phosphor screen renders a visible night vision image. The human eye is most sensitive to green contrasts.

Photocathode
Converts light (photon energy) into electrons (electrical energy) which are then amplified in the intensifier. The objective lens focuses available light on the photo-electric surface of the photocathode which is excited and passes electrons within the tube.

Resolution
A measure of the ability to render and display a detailed image. Image intensifier resolution remains constant and is expressed as the maximum number of line pairs per millimeter (lp/mm) that can be discerned when a black-and-white stripe pattern is focused on the photocathode.